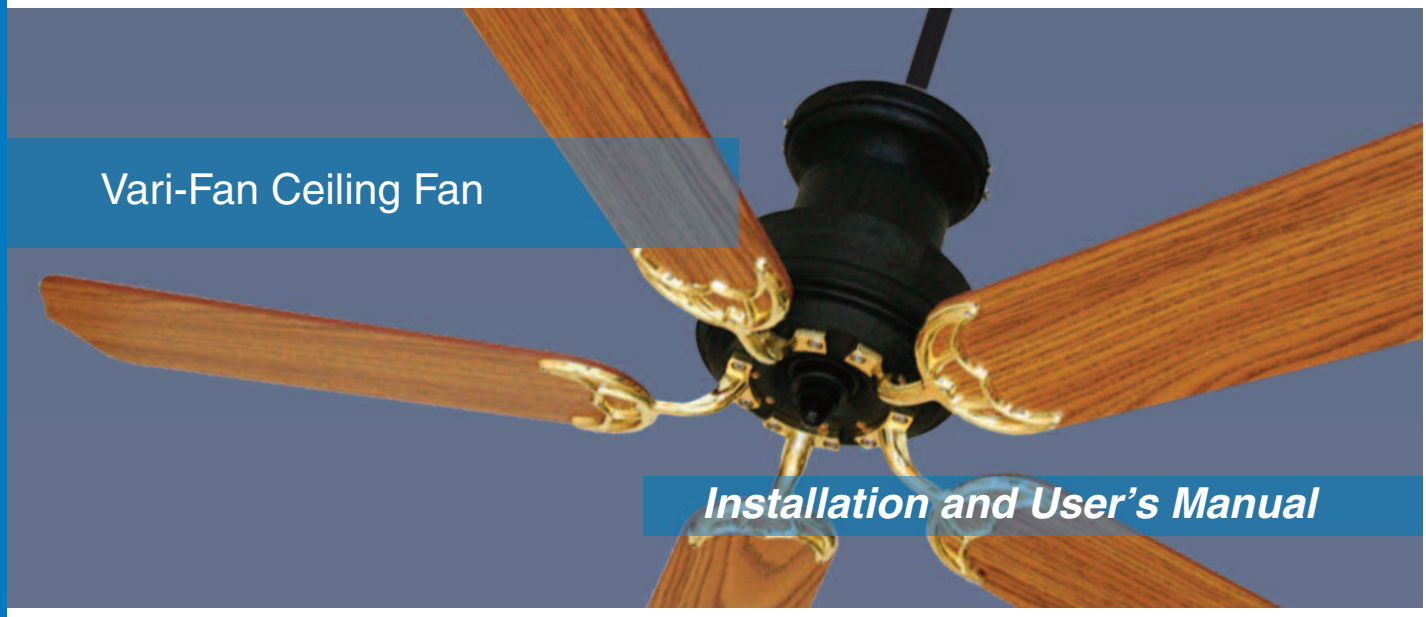
NEXTEK
Power Systems



Vari-Fan Ceiling Fan

Installation and User's Manual

Models:

4-Blade Vari-Fan
5-Blade Vari-Fan*

Rev 010713

Please contact Customer Support at 1-800-24VOLTS for further information.

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TABLE OF CONTENTS

For more information:

Nextek Power Systems
461 Burroughs Street
Detroit, Michigan 48202

Tel: 313-887-1321
Toll free: 1 (877) 24-VOLTS
Fax: 313-887-9433

www.nextekpower.com

info@nextekpower.com

ABOUT NEXTEK POWER SYSTEMS

Nextek Power Systems AC/DC integration technology represents a breakthrough in on-site electrical management, combining the availability of AC power with the quality and efficiency of a DC supply.

NEXTEK PRODUCT BENEFITS

- Easy conversion of AC lighting fixtures to DC-powered units
- Easy conversion of AC grid power into DC power for commercial building applications
- Highly efficient management of peak loads
- Future-proof lighting and other systems to be developed
- Nextek Power Systems Direct Coupling® Technology, directly connects clean power generated at a building to its electronic loads inside cutting down on overall power consumption, boosts electricity generated and stored on-site, and delivers a robust renewable energy ready network.

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PRODUCT INTRODUCTION

Nextek Vari-Fan DC Powered Ceiling Fans

Features:

- Can be mounted 10” to 48” from ceiling (4” down rod included, custom rods can be made)
- Can be assembled with either 4 or 5 blades
- Body is black, but comes with instructions for easy painting
- Body parts are made from injection molded, glass filled ABS plastic
- Blade arms are cast metal with a polished brass finish
- Blades are laminated with a light faux wood finish on one side and a dark faux wood finish on the other side

The Vari-Fan DC Powered Ceiling Fan is the perfect choice for a variety of indoor/outdoor applications, including homes, enclosed porches, greenhouses, warehouses, offices, schools and cabins. Everything you need to assemble and mount a 4- or 5-blade Vari-Fan comes right in the box.

The Vari-Fan is powered by a permanent magnet, TENV (totally enclosed non-ventilated) motor with long life brushes. The motor draws 0.5 amps at 12 VDC and 0.78 amps at 24 VDC. At 12 VDC the 5-blade fan will run at approximately 60 rpm, moving 1,500 CFM when mounted at least 8 feet above the floor in an open room. At 24 VDC the 5-blade fan will run at approximately 120 rpm, moving 2,700 CFM when mounted at least 8 feet above the floor in an open room.

For maximum efficiency use the Nextek Power Systems Speed Control in conjunction with the Vari-Fan DC Powered Ceiling Fans. The Speed Control makes clockwise and counter-clockwise rotation possible.

1.0 SAFETY

1.1 SAVE THESE INSTRUCTIONS– This manual contains important safety and operating instructions for the Nextek Vari-Fan Ceiling Fan.

The following symbols are used throughout this manual to indicate potentially dangerous conditions or mark important safety instructions:

DANGER:
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING:
Indicates a potentially dangerous condition. Use extreme caution when performing this task.

CAUTION:
Indicates a critical procedure for safe and proper operation of the controller.

NOTE:
Indicates a procedure or function that is important for the safe and proper operation of the controller.

1.2 Before using the fan, read all instructions and cautionary markings.

1.3 Electrical hazards are probably the most common hazards throughout the industry. Virtually all workplaces have electrical installations and use electricity.

1.4 It is very important that all industry employees be familiar with electrical hazards and know how to protect themselves when working on, near, or with electricity. In most cases, industry electrical and electronic equipment is designed for both maximum safety and efficiency. However, potentially hazardous conditions such as inadvertent contact with hazardous voltages may exist while performing servicing and maintenance, handling materials, or cleaning.

1.5 The improper use of electrical extension cords and portable electrical equipment can result in hazardous exposure.

1.6 

WARNING - RISK OF ELECTRICAL SHOCK

Read all of the instructions and cautions in the manual before beginning installation.

1.7 

DANGER – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, CAREFULLY FOLLOW THESE INSTRUCTIONS

1.0 SAFETY

1.7.1 Do not disassemble or attempt to repair the fan other than the troubleshooting procedures listed in this manual.

1.7.2 Disconnect power to the unit before installing, removing, cleaning or otherwise maintaining the unit.

1.8 INSTALLATION SAFETY PRECAUTIONS

1.8.1 Mount the fan indoors. Prevent exposure to the elements and do not allow water to enter the fan.

1.8.2 The Vari-Fan is to be connected to DC circuits only

2.0 STANDARDS AND REQUIREMENTS

2.1 All DC cable types must meet all local and national codes

2.2 Shut off all DC circuit breakers or fuses before installing any unit into the field

3.0 INSTALLATION QUALIFICATIONS

3.1 Installation work and electrical wiring of permanently-connected power units must be performed only by qualified service personnel in accordance with all applicable codes and standards, including fire-rated construction.

4.0 SPECIFICATIONS

For maximum efficiency use 20-Watt Solar Panel and the Nextek Power Systems Speed Control in conjunction with the Vari-Fan DC Powered Ceiling Fans. The Speed Control makes clockwise and counter-clockwise rotation possible.

	4/5-Blade Vari-Fan
MECHANICAL	
Diameter of blade swing	42 inches (1.07 m)
Weight of fan	11 lbs. (4.99 kg)
Shipping weight	12 lbs. (5.44 kg)
ELECTRICAL	
Amps	0.5 @ 12 VDC 0.78 @ 24 VDC
RPM	60 @ 12 VDC 120 @ 24 VDC
CFM	1,500 @ 12 VDC 2,700 @ 24 VDC

The Vari-Fan is powered by a permanent magnet, TENV (totally enclosed non-ventilated) motor with long life brushes. The motor draws 0.5 amps at 12 VDC and 0.78 amps at 24 VDC. At 12 VDC the 5-blade fan will run at approximately 60 rpm, moving 1,500 CFM when mounted at least 8 feet above the floor in an open room. At 24 VDC the 5-blade fan will run at approximately 120 rpm, moving 2,700 CFM when mounted at least 8 feet above the floor in an open room.

20 WATT SOLAR PANEL:

These panels are glass laminated with aluminum frames with junction boxes on the back.

Peak power (watts) 20 Peak power (volts) 17.3 Peak power (amps) 1.2 Nominal voltage 21.7

Length: 24.4 inches (62.1cm) Width: 11.1 inches (28.2cm) Weight: 5.5 lbs. (2.5kg) Shipping weight: 8.5 lbs. (4.2kg)

SPEED CONTROL:

This unit provides an adjustable 12 to 30 VDC from an input of 11 to 24 VDC. It has a voltage control POT with an On\Off switch to change the fan's direction. It is overload protected by input and output self resetting fuses. This unit will fit in a single gang electrical box.

5.0 NOTES AND WARNINGS

5.1 NOTES:

5.1.1 It is recommended that all Nextek Fanworks DC ceiling fans be used in conjunction with the Nextek 12/24V Speed Controller.

5.1.2 If operating in a 12V environment, the 12/24V speed control is required.

5.1.3 The Nextek DC ceiling fans can be operated above 24VDC, but not to exceed 48VDC. A 48VDC Speed Controller can be special ordered. The 12/24V speed control is designed to work only between 12V and 24V.

5.1.4 A Nextek 12.6 watt solar panel is available and perfectly matched for this DC powered ceiling fan and speed control.

5.1.5 For new installations: This is a low-voltage 12/24V DC-powered device. Appropriate sizing of a solar panel, battery and battery charge controller are essential for proper operation. Consult a qualified installer of DC devices to insure correct configuration.

5.1.6 For installation in existing DC power environment: Great care must be taken to ensure fan is wired properly in existing DC power environment. Warranty may be violated if attempting to operate in anything other than 12/24V DC. Please consult a qualified technician.

5.1.7 Failure to wire correctly or install in a non-recommended power environment may violate your warranty.

5.2 WARNINGS:

5.2.1 To reduce the risk of fire or electrical shock use Nextek 12/24V speed controls only.

5.2.2 To reduce the risk of personal injury, do not bend the blade brackets when installing the brackets or cleaning the fan. Do not insert foreign objects in between rotating fan blades.

5.2.3 To reduce the risk of personal injury, install the fan only to the building structure according to these instructions, and use only the hardware supplied.

5.3 CAUTIONS:

5.3.1 Read entire instructions carefully before beginning installation.

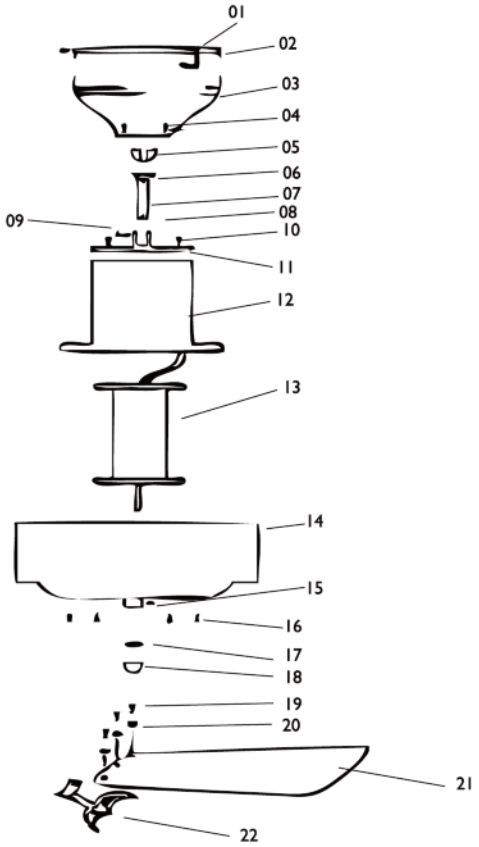
5.3.2 To avoid possible electrical shock, be certain electricity is shut off at main panel before wiring.

5.3.3 All wiring must be in accordance with national and local electrical codes. If you are unfamiliar with wiring, you should use a qualified electrician.

6.0 PARTS INFORMATION

6.1 Parts List

01	1 x Mounting Bracket
02	4 x 10/32 x 3/8 P.H. Phillips
03	1 x Mounting cone
04	4 x 10/32 x 3/8” P.H.Phillips
05	1 x Pivot Ball
06	1 x Retaining Pin
07	1 x Down Rod
08	1 x Pin & Clip
09	1 x 10/32 x 3/8 P.H. Phillips
10	4 x 8/32 x 1/2 F.H. Phillips
11	1 x Receptacle
12	1 x Motor Housing
13	1 x Fan Motor
14	1 x Hub
15	1 x 1/4 /20 x 5/16 Set Screw
16	10 x 10/32 x 3/8 P.H. Phillips
17	1 x Retaining Clip
18	1 x Retaining Knob
19	15 x 10/32 x 1/2 P.H. Phillips
20	15 x Washers
21	5 x Fan Blades
22	5 x Blade Arms



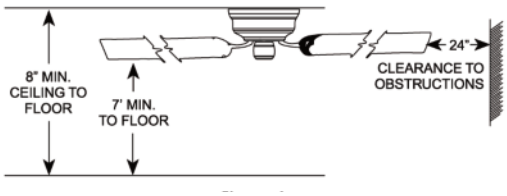
7.0 INSTALLATION PROCEDURE

7.1 Pre-Installation Instructions

7.1.1 Select installation site. Check to see that in normal use no object can come in contact with the rotating fan blades. The mounting site should also meet the precautions listed in Step 7.3 below.

7.1.2 Installation hardware is included for a standard drywall or plaster ceiling. You will need a 4" x 1-1/2" or a 4" x 1/2" outlet box and wire nuts (2), which can be purchased from any hardware store or electrical supply house.

7.1.3 The fan blades must be mounted at least 7' above the floor. For maximum efficiency, they should not have any obstruction (walls, posts, etc.) within 24" of the blade tips. See Figure 1 for mounting distances.



7.2 Inspection of Fan

7.2.1 Unpack the fan carefully to avoid any damage to the components.

7.2.2 Check for any shipping damage to the motor and the fan blades. If more than one fan is being installed, keep the matched and balanced fan blades in sets, as they were shipped. Should one of the fan blades become damaged during shipment, return all blades in the set for replacement.

7.2.3 Check contents to be certain it contains a bag of parts.

7.3 Installation of Outlet Box and Rough-In Wiring

CAUTIONS:

Your ceiling fan, when operating, can have a weight plus downdraft of up to 35 lbs. The following precautions must be taken for safety and to ensure that your fan is securely mounted to the ceiling.

Be certain electricity is “off” at fuse panel when inspecting or repairing installation site.

All wiring must meet local and national electrical codes.

Do not mount directly to an unsupported ceiling or to an electrical outlet box. Mounting must support a total weight of 35 lbs.

7.0 INSTALLATION PROCEDURE

7.3.1 Secure metallic outlet box 4" x 1-1/2" or 4" x 1/2" deep to 2 x 4 cross brace between two ceiling joists as shown in Figure 2. The outlet box must be recessed into the ceiling by 1/16" minimum. Secure the outlet box to the cross brace by drilling (2) pilot holes no larger than the minor diameter of the wood screws (5/64") and use two #8 x 1-1/2" wood screws and washers. Use the innermost holes for securing the box. Orient the box so the outermost holes will be used in Step 4B.

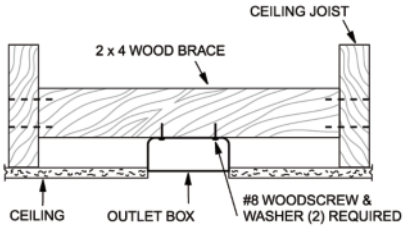


Figure 2

CAUTION:

Do not use a lubricant on screws.

7.3.2 Bring electrical cable into the outlet. Make certain that wiring motor assembly meets all national and local electrical codes. Wire leads should extend at least 6" beyond outlet box for ease in making connections. See Figure 3.

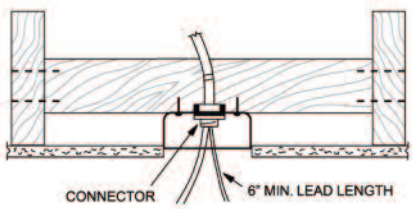
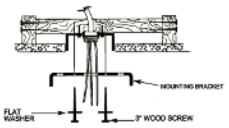


Figure 3

7.4 Fan Assembly Close Mount Version

7.4.1 Remove mounting bracket (#1) from mounting cone (#3). Leave the screws in the bracket that match up with the open hole on each side of mounting cone.

7.4.2 Attach mounting bracket to junction box or directly to ceiling using screws taped to mounting bracket. Lead wires through center hole in bracket.



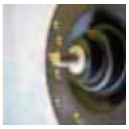
7.4.3 Remove retaining knob (#18) and clip (#17) from bag found inside hub (#14).

7.4.4 Align the hub (#14) with the motor shaft (#13). Align the flat side of the motor shaft to the allen screw hole. Push hub onto shaft until 3/8" (1cm) of the shaft protrudes from the hub. Tighten set screw using allen wrench included with fan.

NOTE: To prevent wobble, make sure the FLAT of the motor shaft is aligned with the FLAT of the center of hub. The set screw should be tightened against the center of the FLAT of the motor shaft.

7.0 INSTALLATION PROCEDURE

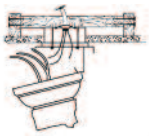
7.4.5 Push retaining clip (#17) onto motor shaft unit until it is firmly against the hub.



WARNING: Failure to install the retain clip tightly against the hub as described may cause separation of the hub during fan operation. Serious injury may result. Consult a qualified installer if in any doubt about installation procedures.

7.4.6 Push retaining knob (#18) onto motor shaft until it is firmly against the hub.

7.4.7 Lift completed motor and hub assembly to mounting bracket on ceiling, and slip one hole on side of mounting cone over hook on bracket.



7.4.8 With motor and assembly hanging from hook, connect fan wires to the house wires using three (3) wire nuts included with fan. Connect white wire of fan to the negative power house wire and the black wire of the fan to the positive power house wire. The green wire should be connected to the ground wire on the mounting bracket. Fan should operate in a counter-clockwise direction for downward draw (summer). For upward draw (winter), use the reverse button on the Speed Controller.

7.4.9 After wires are connected, remove fan from hook, and slip mounting cone over mounting bracket. Align the open holes of cone with the two screws, and rotate until cone will stay in place. Then replace the other two screws in cone and tighten all four screws firmly.

7.4.10 Turn on power, and check that motor shaft is turning in a counter clockwise direction. Turn power off.

7.4.11 Assemble blade arm (#22) and fan blades (#21) using the 15 screws and washers (#20) that are in bag with blade arms.

7.4.12 Once the blades and arms are assembled, attach the assemblies to the hub using the bag of 10 screws (#16). The inside hole pattern on the hub is for four (4) blades. The outside hole pattern on the hub is for five (5) blades.

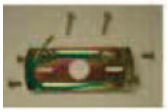
7.4.13 Turn on your fan

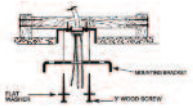
7.0 INSTALLATION PROCEDURE

7.5 Fan Assembly Down Rod Version

7.5.1 Remove mounting bracket (#1) from mounting cone. (#3) Leave the screws in the bracket that match up with the open hole on each side of mounting cone.

7.5.2 Attach mounting bracket to junction box or directly to ceiling using screws taped to mounting bracket. Lead wires through center hole in bracket.





7.5.3 Remove the four screws (#04) holding the mounting cone (#3) to top of fan. Remove cone from top of fan.

7.5.4 Put down rod (#07) through mount cone (pivot ball (#05) end of rod remains in cone).

7.5.5 Feed wires from receptacle through bottom of down rod (#07) and out through the pivot ball end.

7.5.6 Remove retaining pin and retaining clip (#08) from receptacle.

7.5.7 Slip down rod into receptacle, and align holes of rod with hole in receptacle.

7.5.8 Re-insert pin through receptacle/down rod assembly and attach clip.

7.5.9 Tighten screw on side of receptacle.

7.5.10 Align the hub (#14) with the motor shaft (#13). Align the flat side of the motor shaft to the allen screw hole. Push hub onto shaft until 3/8" (1cm) of the shaft protrudes from the hub. Tighten set screw using allen wrench included with fan.

NOTE: To prevent wobble, make sure the FLAT of the motor shaft is aligned with the FLAT of the center of hub. The set screw should be tightened against the center of the FLAT of the motor shaft.

7.5.11 Push retaining clip (#17) onto motor shaft unit until it is firmly against the hub.

WARNING: Failure to install the retain clip tightly against the hub as described may cause separation of the hub during fan operation. Serious injury may result. Consult a qualified installer if in any doubt about installation procedures.

7.0 INSTALLATION PROCEDURE

7.5.12 Push retaining knob (#18) onto motor shaft until it is firmly against the hub.

7.5.13 Lift completed motor and hub assembly to mounting bracket on ceiling, and slip one hole on side of mounting cone over hook on bracket.

7.5.14 With motor and assembly hanging from hook, connect fan wires to the house wires using three (3) wire nuts included with fan. Fan should only be operated in a counter-clockwise direction. Connect white wire of fan to the negative power house wire and the black wire of the fan to the positive power house wire. The green wire should be connected to the ground wire on the mounting bracket.

7.5.15 After wires are connected, remove fan from hook, and slip mounting cone over mounting bracket. Align the open holes of cone with the two screws, and rotate until cone will stay in place. Then replace the other two screws in cone and tighten all four screws firmly.

7.5.16 Turn on power, and check that motor shaft is turning in a counter clockwise direction. Turn power off.

7.5.17 Assemble blade arm (#22) and fan blades (#21) using the 15 screws and washers (#20) that are in bag with blade arms.

7.5.18 Once the blades and arms are assembled, attach the assemblies to the hub using the bag of 10 screws (#16). The inside hole pattern on the hub is for four (4) blades. The outside hole pattern on the hub is for five (5) blades.

7.5.19 Turn on your fan.

8.0 PAINTING

8.1 Painting

8.1.1 The Vari-Fan can be easily painted using an acrylic based spray paint.

8.1.2 Dark colors (red, blue, green, or brown) should take only one coat of paint.

8.1.3 Light colors (white, yellow, or pastels) may take two or more coats. Follow the instructions on the can of spray paint for applying multiple coats.

8.1.4 To disassemble the Vari-Fan, look at the exploded drawing in Parts Information (6.0). This will show you how the fan comes apart. Be sure to use a bag or cup for storing screws and pins.

8.1.5 There are four (4) parts that are normally painted: the mounting cone (part #03), the down rod (part #07), motor housing (part #12), and the hub (part #14). Be sure to remove the set screw from the hub.

8.1.6 The receptacle (part #11) and the pivot ball (part #5) are normally left black.

8.1.7 Using soft wire, make 4 long “S” hooks so each piece may be hung while painting and drying.

8.1.8 Follow the instructions on your can of spray paint for proper spraying technique and drying times required.

8.1.9 Once the painted parts are dry, you may re-assemble the fan following the diagram in Parts Information.

9.0 START UP PROCEDURE

9.1 Start Up Procedures

9.1.1 All Nextek Fanworks DC-powered ceiling fans should be used in conjunction with the Nextek 12/24V Speed Controller.

9.1.2 If operating in a 12V environment, the 12/24V Speed Controller is required.

9.1.3 All Nextek Fanworks DC-powered ceiling fans can be operated above 24VDC, but not to exceed 48VDC. A 48VDC Speed Controller can be ordered.

9.1.4 A Nextek 12.6 watt solar panel is available and is perfectly matched to this DC-powered ceiling fan and Speed Controller.

9.1.5 New Installations: Appropriate sizing of a solar panel, battery and battery charge controller are essential for proper operation. Consult a qualified installer of DC devices to ensure correct configuration.

9.1.6 Existing Environments: Great care must be taken to ensure fan is wired properly in existing DC power environments. Warranty may be violated if attempting to operate in anything other than 12/24 VDC. Please consult a qualified technician.

9.1.7 Failure to wire correctly, or installation in non-recommended power environments may violate your warranty.

CAUTION

9.2.1 Read the entire ceiling fan instruction manual carefully before beginning installation. (See above for download location.)

9.2.2 To avoid possible electric shock, be certain electricity is shut off at main panel before wiring.

9.2.3 All wiring must be in accordance with national and local electrical codes. If you are unfamiliar with wiring, you should use a qualified electrician.

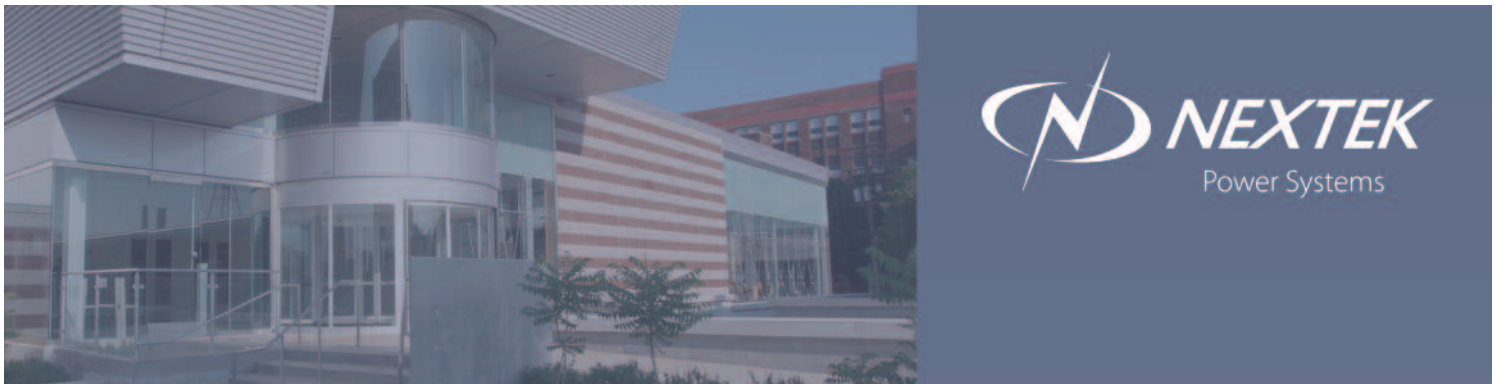
10.0 TROUBLESHOOTING

The following are tips that may help fix a problem that you are having with a Nextek Power Systems Fanworks DC powered ceiling fan.

PROBLEM	PROCEDURE
FAN DOESN'T RUN	Check all connections to make sure you have power, use a volt meter or multi tester to confirm that the voltage is correct. If fan still doesn't run, try connecting the fans leads directly to the battery (no switches or speed controls) If fan still won't run, please contact Nextek Power Systems Fanworks, not your dealer.
FAN MOTOR IS HOT TO THE TOUCH	Turn off fan immediately, and contact Nextek Power Systems Fanworks.
FAN MAKES "CLICKING" NOISE	The "clicking" noise is usually a bur on one or both brushes. First try reversing the fan (i.e.: make it run backwards) this can be done by reversing the polarity of the fans wires at the battery. If your fan has a speed control but no reversing switch, reverse the leads that run from the speed control to the fan. In either case, let the fan run at least 24 hours in reverse, then try running the fan in forward and see if the noise stops. A second option, if your fan is not too high up, is to take a broom handle and give a sharp upward rap to the decorative nut at the center of the fan hub. (Do this while the fan is running) Please note: Fans in summer cottages or in places where the fan is not run for long periods of time are more prone to developing a burr on the brushes. Before starting fan, gently spin the blades by hand, and then turn on fan. If problem persists, please contact Nextek Power Systems Fanworks.
MY FAN WOBBLES WHEN RUNNING	Most fans mounted with a down rod will have a slight wobble (less than 1 inch from the center) depending on how long the down rod is. All Nextek Power Systems Fanworks fans come from the factory with balanced blades and blade arms. Make sure that the when the hub was placed on the fan shaft, the flat on the shaft matched the flat on the hub's center hole. Check that all the blade arms have the same pitch. (Lay them in line on a flat surface and check that all the blade arms lay at the same angle.) If the pitch on one of the blade arms is different, try twisting the arm until it matches the rest of the arms. Most large hardware stores—Home Depot, Lowes, Ace, etc, that sell ceiling fans—have blade balancing kits. These are inexpensive and have easy-to-understand instructions, and may be an alternative if the above ideas don't work.

10.0 TROUBLESHOOTING

PROBLEM	PROCEDURE
MY FAN MAKES A RUBBING SOUND WHEN RUNNING	Turn your fan off, and when the blades have stopped turning, spin the fan with your hand, if you hear the rubbing sound, it is most likely that the fan's hub is rubbing against the motor housing. Loosen the hub's set screw; remove the decorative knob covering the fan's motor shaft. Using a flat bladed screwdriver, pry the safety push nut away from the hub (about 1/8 inch) Try spinning the fan again, if the rubbing sound is gone, then re-tighten the set screw and replace the decorative knob.
MY FAN'S BLADES SEEM TO GO UP AND DOWN AS THE FAN SPINS	Turn fan off, gently rotate hub by hand, look for the high and low movement of the blades. Grab the hub at the high spot with one hand, with your other hand, grab the low spot, then "gently" push the low side of the hub up while pulling down on the high side. Spin the hub again and see if the up/down wobble is gone, if not, repeat the procedure until problem is fixed.



For more information:

Nextek Power Systems
461 Burroughs Street
Detroit, Michigan 48202
www.nextekpower.com

Tel: 313-887-1321
Toll free: 1 (877) 24-VOLTS
Fax: 313-887-9433
info@nextekpower.com

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